

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Previously Presented): An apparatus comprising a rendering engine that defines a rectangular area of pixels that bounds a triangular area of the pixels, selects a line of pixels within the rectangular area of pixels, sequentially evaluates coordinates associated with the pixels of the line of pixels to determine whether the pixels fall within the triangle area, and ceases evaluation of the coordinates associated with the pixels of the line of pixels upon determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area.

2. (Original): The apparatus of claim 1, wherein the rendering engine evaluates the coordinates of the pixels in accordance with a set of linear equations that describe edges of the triangular area.

3. (Original): The apparatus of claim 2, wherein the rendering engine computes a coefficient matrix M_C for computing linear coefficients for the set of linear equations, and applies the coefficient matrix M_C to each of the pixels within the rectangular area to determine whether each of the pixels falls within the triangular area.

4. (Original): The apparatus of claim 3, wherein the rendering engine applies the coefficient matrix M_C to a current one of the pixels (X_C , Y_C) within the rectangular area to determine whether:

$$M_C \begin{bmatrix} X_C \\ Y_C \\ 1 \end{bmatrix} \leq \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \text{ where}$$

the coefficient matrix M_C equals:

$$M_c = \begin{bmatrix} y_1 - y_2 & x_2 - x_1 & x_1 y_2 - x_2 y_1 \\ y_2 - y_0 & x_0 - x_2 & x_2 y_0 - x_0 y_2 \\ y_0 - y_1 & x_1 - x_0 & x_0 y_1 - x_1 y_0 \end{bmatrix} \text{ and}$$

vertices $v_0(x_0, y_0)$, $v_1(x_1, y_1)$, and $v_2(x_2, y_2)$ are vertices of the triangular area.

5. (Original): The apparatus of claim 1, wherein the rendering engine selectively renders the pixels that fall within the triangular area by computing updated pixel data for those pixels in accordance with a set of linear equations that describe one or more attributes associated with the triangular area.

6. (Original): The apparatus of claim 5, wherein the attribute values comprise at least one of color values and texture values.

7. (Original): The apparatus of claim 5, wherein the rendering engine computes a coefficient matrix M^{-1} for computing linear coefficients A, B, C of the set of linear equations, and applies the coefficients A, B, C to each pixel that falls within the triangular area to compute an attribute value for the respective pixel.

8. (Original): The apparatus of claim 7, wherein the rendering engine applies the coefficient matrix M^{-1} to compute the linear coefficients A, B, C, for an attribute associated with vertices $v_0(x_0, y_0)$, $v_1(x_1, y_1)$, and $v_2(x_2, y_2)$ of the triangle as:

$$\begin{bmatrix} A \\ B \\ C \end{bmatrix} = M^{-1} \begin{bmatrix} v_0 \\ v_1 \\ v_2 \end{bmatrix},$$

where the coefficient matrix M^{-1} equals:

$$M = \begin{bmatrix} x_0 & y_0 & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{bmatrix}, \text{ and}$$

an attribute value for each pixel (X_c, Y_c) is computed as

$$v = AX_c + BY_c + C.$$

9. (Original): The apparatus of claim 1, further comprising a z-buffer storing a set of z-values associated with the pixels, and wherein the rendering engine compares a z-value, z_c , of the current pixel with a corresponding z-value, z_b , of a z-buffer to determine whether each pixel within the rectangular area is visible and selectively renders each pixel of the rectangular area that is visible and that falls within the triangle area.

10. (Original): The apparatus of claim 1, further comprising a control unit that issues a command to the rendering engine that specifies vertices of the triangular area.

11. (Original): The apparatus of claim 1, wherein the rendering engine comprises:
a vertex buffer for buffering the vertices of the triangular area to be rendered;
a bounding box generator that processes the vertices to compute bounding data that define the dimensions of the rectangular area; and
a rasterizer that processes the bounding data and evaluates coordinates associated with the pixel values of the rectangular area to selectively render the pixels that fall within the triangular area.

12. (Original): The apparatus of claim 11, further comprising:
an edge coefficient generator that receives the vertices buffered by the vertex buffer and processes the vertices to compute linear coefficients for a set of linear equations that describe edges of the triangular area, and
an attribute coefficient generator that processes the vertices to compute linear coefficients for a set of linear equations that describe one or more attributes associated with the triangular area, wherein
the rasterizer processes the bounding data and the coefficients in accordance with the sets of linear equations to render the pixels that fall within the triangular area.

13. (Original): The apparatus of claim 1, wherein the apparatus comprises a wireless communication device.

14. (Original): The apparatus of claim 1, wherein the apparatus comprises an integrated circuit.

15. (Original): The apparatus of claim 1, further comprising a cache memory to store at least a portion of the pixels, wherein the cache memory has a block size, and the rendering engine defines the rectangular area as a function of the block size of the cache.

16. (Withdrawn): A mobile communication device comprising:
a display;
a processor to generate video output data for presentation by the display as a graphical environment; and
a rendering engine that applies a direct evaluation algorithm to render a triangle for the graphical environment, wherein the direct evaluation algorithm applies a coefficient matrix defining a set of linear coefficients for a set of linear equations that describe edges of the triangle to pixels to render the triangle without interpolating between edges of the triangle.

17. (Withdrawn): The mobile communication device of claim 16, wherein the processor issues a command to the rendering engine that defines vertices for the triangle.

18-31. (Cancelled)